GRADE 9 ACHIEVEMENT TEST

Mathematics

June 1988

Alberta
EDUCATION

GRADE 9 ACHIEVEMENT TEST
MATHEMATICS

GENERAL INSTRUCTIONS

1. This test consists of 75 multiple-choice questions.
2. You have 90 minutes to complete this test.
3. Calculators may be used.
4. Read each question carefully and follow the specific instructions given.
5. Each question has four possible answers from which you are to choose the CORRECT or BEST answer.
6. Mark your choice on the separate answer sheet provided.
7. Use ONLY an HB pencil to mark your answer.

EXAMPLE

1. This test is for the subject area of

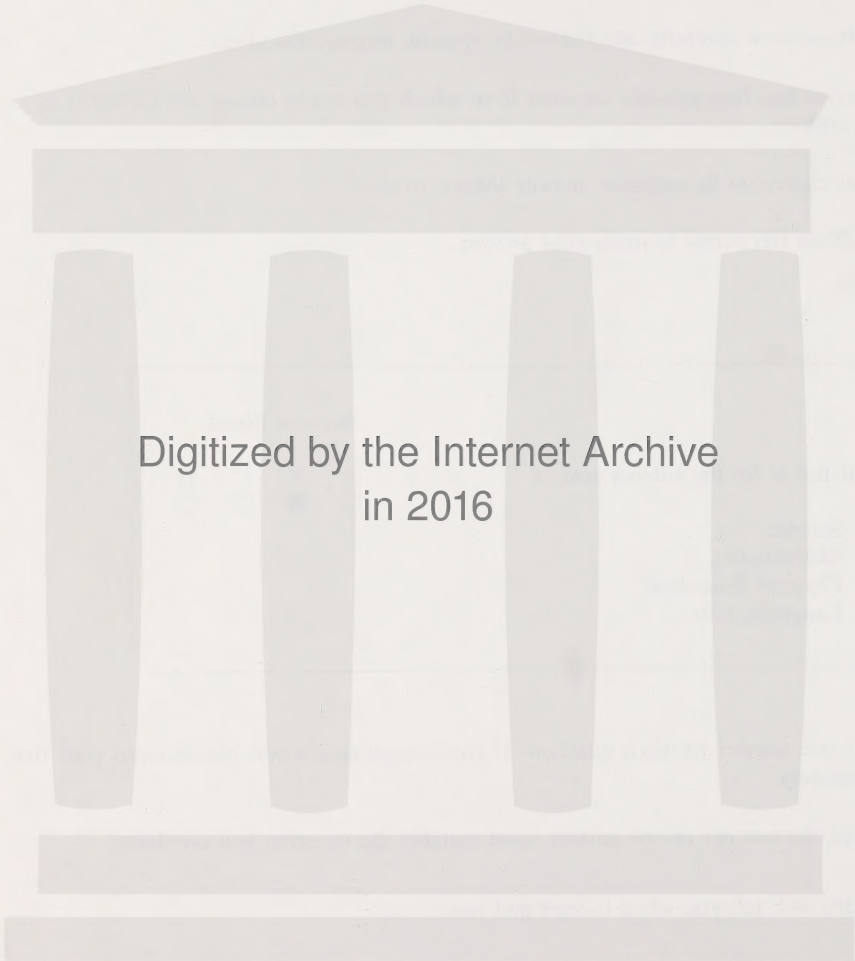
   A. Science
   B. Mathematics
   C. Physical Education
   D. Language Arts

Answer Sheet

	A	B	C	D
1.	○	●	○	○

8. Mark only one answer for each question. If you change an answer, please erase your first mark completely.
9. Be sure that the number on the answer sheet matches the question you are doing.
10. Your teacher will tell you when to start and stop.

DO NOT START THE TEST UNTIL YOUR TEACHER TELLS YOU TO DO SO.



1. Evaluate 3^3.

A. 6
B. 9
C. 27
D. 81

2. A simpler form of $(x^{-3})^2$ is

A. x^{-1}

B. x^{-5}

C. x^{-6}

D. $-x^6$

3. An equivalent form of 7^{-2} is

A. $\frac{1}{7^2}$

B. $\frac{1}{7^{-2}}$

C. -7^2

D. -14

4. If $x \neq 0$ and $y \neq 0$, the value of $(3x^2y)^0$ is

A. 1

B. 3

C. 6

D. $3x^2y$

5. Students in a Grade 9 class have a total of 29 pets. Six students have one pet each, five students have three pets each, and the rest have two pets each. How many students have exactly two pets?

A. 4
B. 6
C. 8
D. 9

6. The prime factorization of 90 is

A. 5×18
B. 6×15
C. $2 \times 5 \times 9$
D. $2 \times 3 \times 3 \times 5$

7. Evaluate $\dfrac{4(-5 + 3) - 2(-1 + 5)}{-6 + 2}$

A. -2
B. -4
C. 2
D. 4

8. The standard form of 8.23×10^{-6} is

A. 8 230 000
B. 823 000
C. 0.000 823
D. 0.000 008 23

9. $-1\frac{1}{4} + \left(-\frac{1}{3}\right) - \left(-\frac{5}{6}\right)$ equals

A. $-\frac{29}{12}$

B. $-\frac{3}{4}$

C. $\frac{1}{12}$

D. $\frac{7}{4}$

10. Compute $-\frac{4}{3} \div \left(-\frac{2}{3}\right)$.

A. -2

B. $-\frac{8}{9}$

C. $\frac{8}{9}$

D. 2

11. $\frac{2}{25}$ is equivalent to

A. 0.02
B. 0.08
C. 0.8
D. 12.5

12. 0.56 expressed as a fraction in lowest terms is

A. $\frac{56}{10}$

B. $\frac{28}{25}$

C. $\frac{14}{25}$

D. $\frac{56}{1000}$

13. Mr. Brown has a total debt of \$240. If $\frac{5}{12}$ of his debt is a bank loan, then the amount he owes the bank is

A. \$140
B. \$100
C. \$80
D. \$60

14. At 5 a.m. the temperature was $-10°C$. At noon it was $11°C$. If the temperature changed by the same amount each hour between 5 a.m. and noon, what number of degrees did it change each hour?

A. 3°
B. 2.625°
C. 0.143°
D. 0.125°

15. A rectangular living room is 6.1 m by 4.8 m. If carpet costs $\$29.85/m^2$, then the best method of estimating the cost of the carpet would be

A. $6 \times 5 \times 30$
B. $6 \times 5 \times 20$
C. $6 \times 4 \times 30$
D. $6 \times 4 \times 20$

16. The Smiths want to lay grass sod to make a rectangular lawn. The sod costs $\$0.95/m^2$ and the Smiths need \$599.55 worth of sod. If the width of the lawn is 19 m, then its length is approximately

A. 3 m
B. 20 m
C. 30 m
D. 60 m

17. The square root of 8 is

A. 64
B. 4
C. between 3 and 4
D. between 2 and 3

18. $\frac{7}{8}$ is equivalent to

A. 0.875%
B. 8.75%
C. 87.5%
D. 114%

19. If $\frac{12}{n} = \frac{36}{21}$, the value of n is

A. 36

B. 7

C. 3

D. $\frac{7}{9}$

20. 21.6 is 15% of

A. 324
B. 144
C. 14.4
D. 3.24

21. Nancy walked a distance of 3.6 km in 30 min. Her speed in km/h was

A. 0.12
B. 1.8
C. 7.2
D. 108

22. The distance from the city limits of Edmonton to the city limits of Calgary is 300 km, and the distance from my house in Edmonton to my brother's house in Calgary is 340 km. If I travel 100 km/h from city limits to city limits and 50 km/h within the city limits, how long will it take me to travel from my house to my brother's house?

A. 3 h
B. 3 h 24 min
C. 3 h 48 min
D. 6 h 48 min

23. Mona bought a stereo on sale at a discount of 30%. If the regular price of the stereo was $682.50, how much did she pay for the stereo?

A. $204.75
B. $477.75
C. $588.75
D. $887.25

24. A salesman sold a total of $12 000 worth of merchandise in June. He is paid a salary of $1 000 per month and a commission of 8% of his total sales. His earnings in June were

A. $13 008
B. $1 960
C. $1 096
D. $960

25. A floor plan of a house is drawn to the scale 1 cm represents 0.80 m. On the plan, the kitchen is 5 cm by 6.5 cm. What are the actual dimensions of the kitchen?

A. 0.4 m by 0.52 m
B. 4 m by 5.2 m
C. 5 m by 6.5 m
D. 40 m by 52 m

26. 1 m equals

A. $\frac{1}{100}$ dm

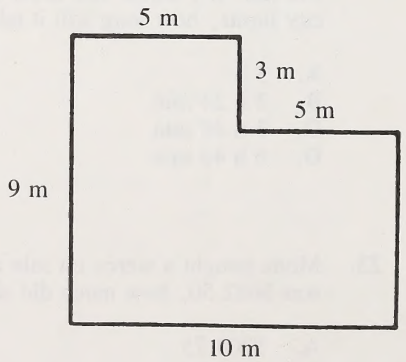
B. $\frac{1}{10}$ dm

C. 10 dm

D. 100 dm

27. The perimeter of the figure at the right is

A. 32 m
B. 37 m
C. 38 m
D. 41 m



28. A paper measuring 20 cm by 30 cm is cut in half and each piece is cut in half again. Then each piece is cut in half again. What is the area of each piece of paper after the third cut?

A. 300 cm^2

B. 150 cm^2

C. 100 cm^2

D. 75 cm^2

29. If the perimeter of a square is 24 cm, then its area is

A. 36 cm^2

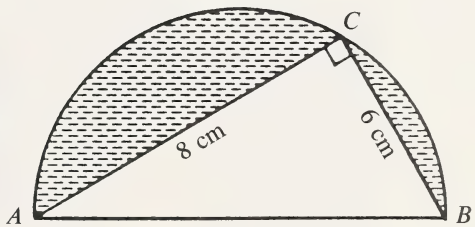
B. 24 cm^2

C. 16 cm^2

D. 6 cm^2

30. *AB* is the diameter of the semicircle at the right. The area of the shaded portion of the semicircle is

($\pi = 3.14$)



A. 9.25 cm^2

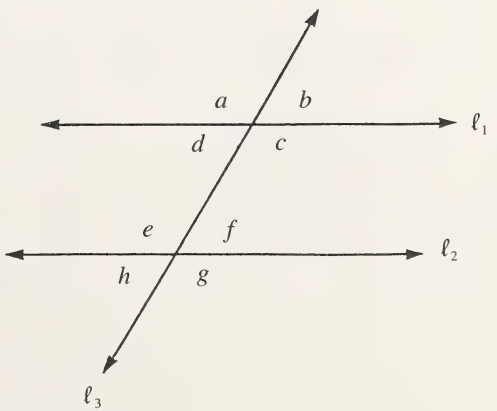
B. 15.25 cm^2

C. 54.50 cm^2

D. 290.00 cm^2

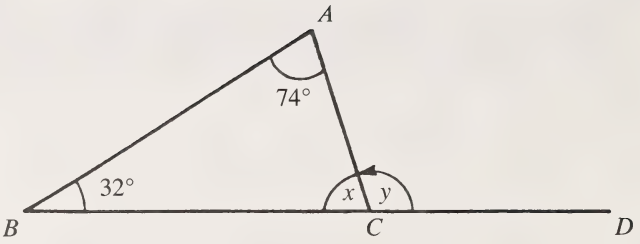
31. In the diagram at the right, $\angle a$ and $\angle e$ are

A. linear angles
B. opposite angles
C. alternate angles
D. corresponding angles



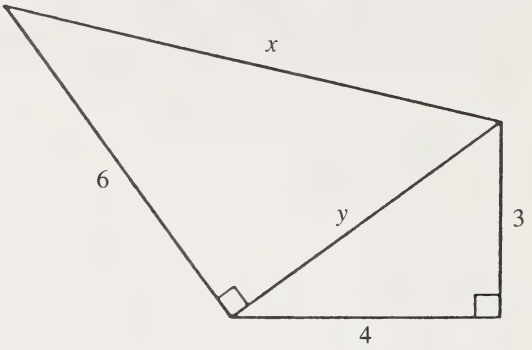
32. In the diagram at the right, the value of y is

A. 32°
B. 72°
C. 74°
D. 106°



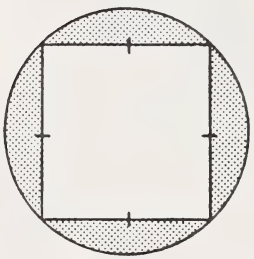
33. In the figure at the right, x equals

A. 3.3
B. 5
C. 7.8
D. 11



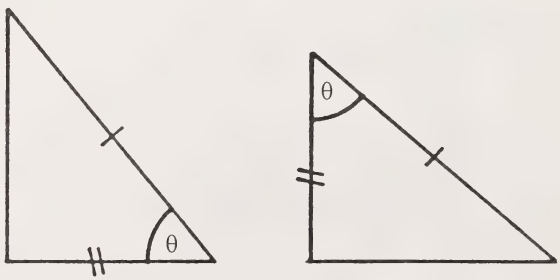
34. In the diagram at the right, if the diameter of the circle is 2 cm, the length of each side of the square is

A. 1.41 cm
B. 2.00 cm
C. 2.82 cm
D. 8.00 cm

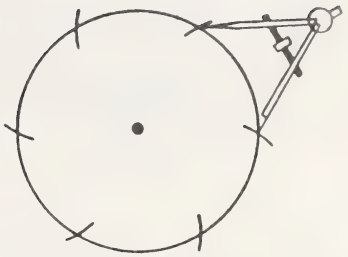


35. The two triangles at the right are congruent by the

A. AAA property
B. ASA property
C. SAS property
D. SSS property

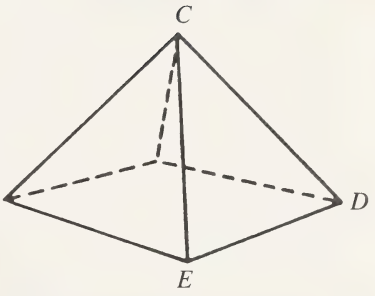


36. The diagram at the right shows the beginning of the construction of a regular



A. pentagon
B. hexagon
C. octagon
D. decagon

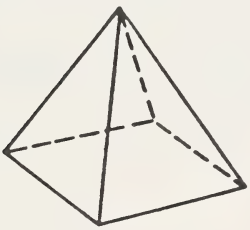
37. In the diagram at the right, *CDE* is



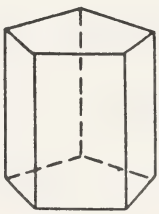
A. an edge
B. a base
C. a face
D. a slant height

38. Which of the following figures is a hexagonal pyramid?

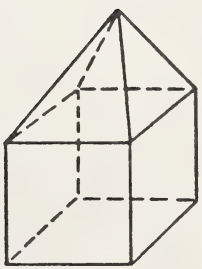
A.



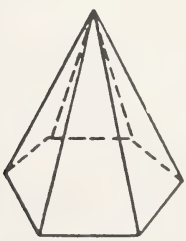
B.



C.



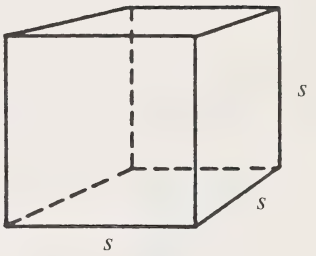
D.



39. To construct a model of a regular pentagonal prism, the shapes needed are

A. 2 pentagons and 5 rectangles
B. 5 pentagons and 5 rectangles
C. 5 pentagons and 2 rectangles
D. 5 pentagons

40. The total surface area of the figure at the right could be calculated by using the formula



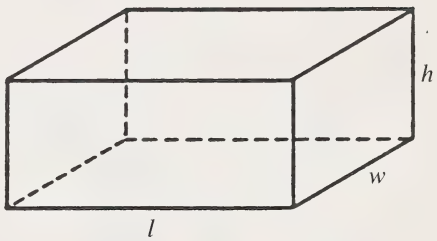
A. $A = 3s$

B. $A = 12s$

C. $A = 6s^2$

D. $A = s^3$

41. The formula for the volume of a rectangular right prism is $V = Bh$. For the diagram at the right, B can be replaced by



A. $\frac{1}{2} lw$

B. lw

C. $2l + 2w$

D. $2l + 2w + 2h$

42. The formula for the volume of a solid cylinder is $V = \pi r^2 h$. If a cylinder has a volume of 197.82 m^3 and a radius of 3 m, what is its height?

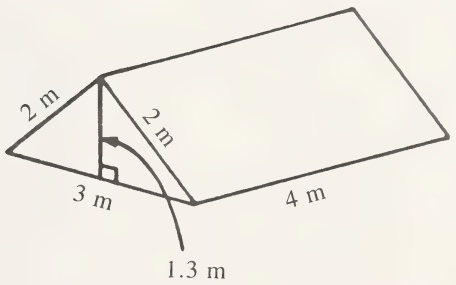
($\pi = 3.14$)

A. 593.46 m
B. 28.26 m
C. 21 m
D. 7 m

43. What is the maximum number of 3 cm cubes that can be placed in a box with inside dimensions of 12 cm by 18 cm by 12 cm?

A. 96
B. 72
C. 24
D. 18

44. If the tent at the right does not have a floor, the total surface area of the tent is



A. 31.9 m^2

B. 19.9 m^2

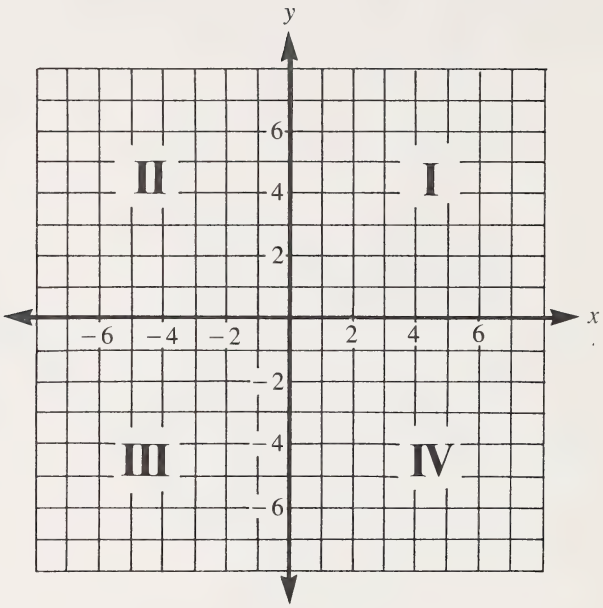
C. 11.9 m^2

D. 10.0 m^2

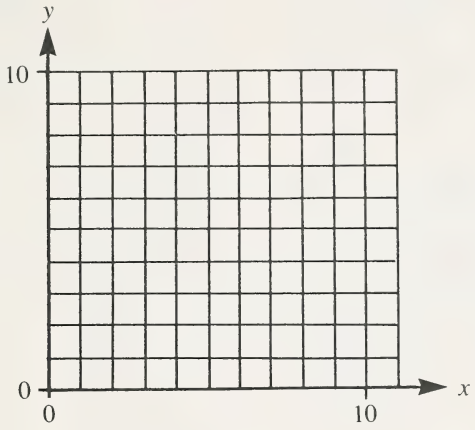
45. If the values given in the table at the right are plotted on the graph below, the points would be located in quadrants

x	2	3	4	5
y	-3	-1	1	3

A. I and II
B. II and III
C. III and IV
D. IV and I



46. The co-ordinates (0,3), (3,0), and (6,3) are the three vertices of a square. Graph these co-ordinates on the grid below.



What would be the co-ordinates of the fourth vertex?

A. (3,6)
B. (0,6)
C. (6,0)
D. (6,6)

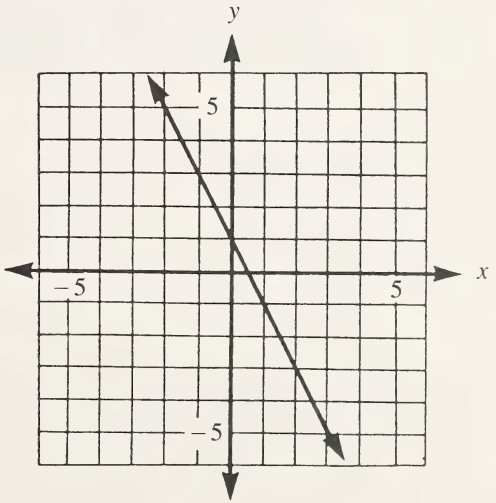
47. The graph at the right represents the relation

A. $y = 2x + 1$

B. $y = -2x + 1$

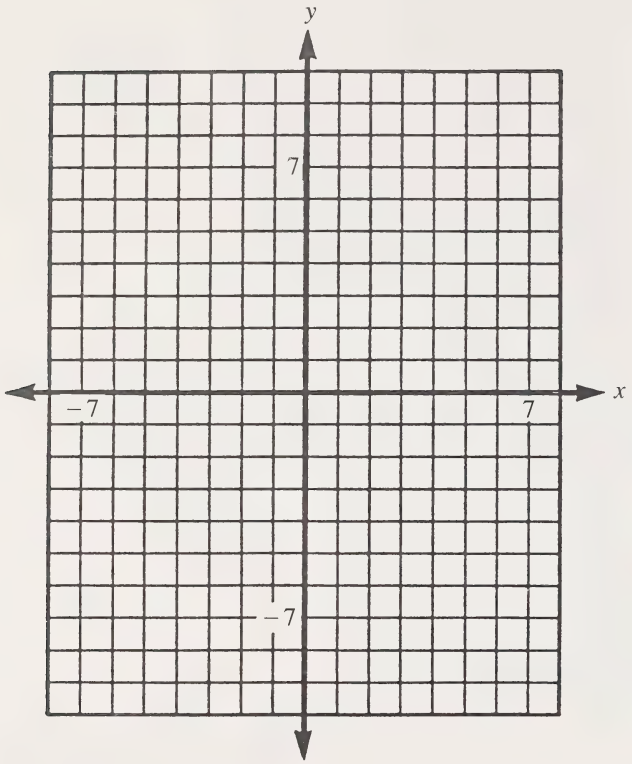
C. $y = x$

D. $y = \frac{1}{2}x$



48. The values in the chart at the right determine a line. From the given values, make the graph on the grid provided below.

x	-6	-2	3	5
y	-8	-4	1	3

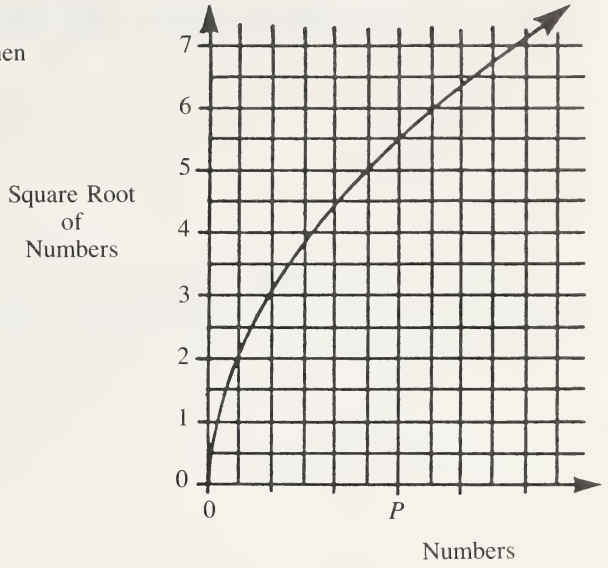


The graph crosses the x-axis at

A. (0,3)
B. (3,0)
C. (0,2)
D. (2,0)

49. From the graph at the right, if P represents a number, then $\sqrt{P}$ is approximately

A. 5
B. 5.2
C. 5.5
D. 5.9



50. If $3(m - 3) - 2(m + 4) = -12$, then m is

A. -29
B. -13
C. -11
D. 5

51. If $6y - 2 = 5y + 4$, then y is

A. 6

B. 2

C. $\frac{6}{11}$

D. $\frac{2}{11}$

52. Mr. Smith is three times as old as Jenny. In 10 years the sum of their ages will be 80. How old is Jenny now?

A. 15 years old
B. 20 years old
C. 25 years old
D. 35 years old

53. Peter runs a certain distance at 10 km/h and returns by car at 50 km/h. If his TOTAL time of travel is 1.5 h, how far did he run?

A. 9 km
B. 12.5 km
C. 15 km
D. 18 km

54. The cost of renting video tapes is related to the number of tapes rented. The chart below shows the cost of renting tapes.

Number of Tapes (n)	1	2	3	4	5	6	7
Cost in Dollars (c)	3	5	7	9	11	13	15

What is the relation between n and c?

A. $c = 3n$

B. $c = n + 2$

C. $c = 2n + 1$

D. $c = n^2 + 2$

55. Twelve people can deliver 2 400 newspapers in 3 h. Working at the same rate, four people could deliver 2 400 newspapers in

A. 1 h
B. 9 h
C. 36 h
D. 144 h

56. In the formula $A = xy$, if x is halved and y is doubled, then A is

A. unchanged
B. twice as large
C. two and one half times as large
D. four times as large

57. The formula for converting Celsius temperatures to Fahrenheit temperatures is $F = 1.8C + 32$. The correct Fahrenheit temperature for $35°C$ is

A. 63°
B. 67°
C. 95°
D. 121°

58. Karen borrowed \$5 000 from the bank to buy a car. After 12 months she paid the bank \$5 000 plus \$600 in interest. What was the rate of interest that the bank charged per year?

A. 50%
B. 12%
C. 8%
D. 6%

59. Jan and Gerry live 840 km apart. They leave their homes at the same time and drive towards each other. Jan drives at 60 km/h and Gerry drives at 80 km/h. The distance travelled by Jan when she meets Gerry is

A. 480 km
B. 360 km
C. 42 km
D. 6 km

60. How many terms are in the expression $4x^2 + 5x - 7$?

A. 1
B. 2
C. 3
D. 5

61. The value of $x^2 + 3x - 7$ when $x = -2$ is

A. 9
B. -5
C. -9
D. -17

62. $2x^2 - 3x + 7$ is an example of a

A. term
B. monomial
C. binomial
D. trinomial

63. Which polynomial is written in descending order of degree?

A. $8 + 3x + 2x^4 + 9x^5$

B. $3x^3 + 7x^4 + 8x + 2$

C. $7x^4 + 3x^3 + 8x + 2$

D. $9x^5 + 8 + 3x + 2x^4$

64. Seven times a number, increased by six, is forty-one. An equation which represents this mathematical statement is

A. $7n + 6 = 41$
B. $7n - 6 = 41$
C. $7n \times 6 = 41$
D. $7(n + 6) = 41$

65. The numerical coefficient of $-6a^4b$ is

A. ab
B. 6
C. 4
D. -6

66. The simplest form of $6x^2 - 3x + x^2 - 14x + 7$ is

A. $-3x^2$

B. $7x^2 - 10x$

C. $6x^2 - 17x + 7$

D. $7x^2 - 17x + 7$

67. $(8x^2 + 3x - 5) + (4x - 2x^2)$ equals

A. $6x^2 + 7x - 5$

B. $12x^2 + x - 5$

C. $12x^3 + x^3 - 20x + 10x^2$

D. $13x^2 - 5$

68. The simplified form of $\frac{51x^4y^6}{17x^2y^2}$ is

A. $\frac{1}{3}x^2y^3$

B. $\frac{1}{3}x^2y^4$

C. $3x^2y^3$

D. $3x^2y^4$

69. The product of $4x$ and $(3x^2 - 4x + 2)$ is

A. $12x^2 - 16x + 8$

B. $12x^3 - 4x + 2$

C. $7x^3 - 8x^2 + 6x$

D. $12x^3 - 16x^2 + 8x$

70. The greatest common factor of $x^8 + 3x^2$ is

A. x

B. x^2

C. $3x^2$

D. x^8

71. When $9x^2 - 6x + 3$ is factored, the answer is

A. $3(3x - 2)$

B. $9x^2(-6x + 3)$

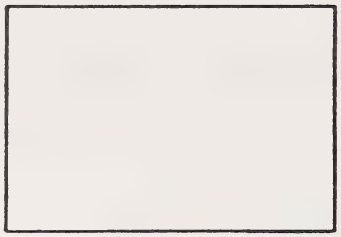
C. $3(3x^2 - 2x + 1)$

D. $(3x - 1)(3x - 3)$

72. The product of $(2x - 5)$ and $(3y + 1)$ is

A. $-10x + 3y + 2x - 15y$
B. $5xy + x - 2y - 4$
C. $6xy - 4 - 15y + 2x$
D. $6xy + 2x - 15y - 5$

73. The area of the rectangle at the right in square units is



A. $x^2 + 7x + 12$

B. $x^2 + 7x + 7$

C. $x^2 + 12$

D. $x^2 + 7$

74. In factored form, $y^2 - 11y + 24$ is equivalent to

A. $(y - 3)(y - 8)$

B. $(y - 4)(y - 6)$

C. $(y + 12)(y + 2)$

D. $(y^2 - 11)(y + 24)$

75. One factor of $x^2 - 9x + 8$ is

A. $(x - 8)$
B. $(x + 8)$
C. $(x - 4)$
D. $(x + 4)$